## REMARKS

The Examiner objected claims 23, 30, 32, and 35 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants gratefully acknowledge the Examiner's indication of allowable subject matter.

The Examiner rejected claims 27, 28 and 31 under 35 U.S.C. §102(b) as allegedly being anticipated by Reimann (U.S. Patent 4,663,497).

The Examiner rejected claims 21-24 under 35 U.S.C. §103(a) as allegedly being unpatentable over Lloyd ('523) in view of Watanabe et al. (U.S. Patent 5,319,159).

The Examiner rejected claim 29 under 35 U.S.C. §103(a) as allegedly being unpatentable over Reimann ('497) in view of Curcio et al. (U.S. Patent 6,504,111).

The Examiner rejected claim 36 under 35 U.S.C. §103(a) as allegedly being anticipated by Lloyd (U.S. Patent 3,601,523) in view of Reimann (U.S. Patent 4,663,497).

The Examiner rejected claim 37 under 35 U.S.C. §103(a) as allegedly being anticipated by Curcio et al. (U.S. Patent 6,504,111) in view of Condensed Chemical Dictionary of Hawley's (hereafter CCD).

The Examiner rejected claims 38-39 under 35 U.S.C. §103(a) as allegedly being anticipated by Rosenthal et al. (US Patent 3,105,729) in view of Reimann ('497).

Applicants respectfully traverse the §102 and §103 rejections with the following arguments.

**35 U.S.C. §102: Claims 27, 28, and 31**

The Examiner rejected claims 27, 28 and 31 under 35 U.S.C. §102(b) as allegedly being anticipated by Reimann (US Patent 4,663,497).

Applicants respectfully contend that Reimann does not anticipate claim 27, because Reimann does not teach each and every feature of claim 27. For example, Reimann does not teach "wherein the lower portion of the conductive element comprises a conductive material, and wherein the upper portion of the conductive element comprises the conductive material.

The language in the preceding feature of claim 27 requires the lower portion and upper portion of the conductive element to comprise the same conductive material. However, the Examiner alleges that in Reimann, the conductive material 38 represents the lower portion of the conductive element of claim 27, and the conductive resist 40 represents the upper portion of the conductive element of claim 27. Reimann states in very strong language that the conductive material 38 and the conductive resist 40 cannot comprise the same conductive material. See Reimann, col. 2, lines 47-50, which recites: "While the conductive cladding and conductive via material may be of the same substance, the resist material must be of a composition which is different therefrom." Accordingly, Applicants maintain that Riemann does not anticipate claim 27.

Based on the preceding arguments, Applicants respectfully maintain that Reimann does not anticipate claim 27, and that claim 27 is in condition for allowance. Since claims 28 and 31 depend from claim 27, Applicants contend that 28 and 31 are likewise in condition for allowance.

**35 U.S.C. §103(a): Claims 21-24**

The Examiner rejected claims 21-24 under 35 U.S.C. §103(a) as allegedly being unpatentable over Lloyd ('523) in view of Watanabe et al. (U.S. Patent No. 5,319,159).

The Examiner has stated that claim 23 would be allowable if rewritten in independent form. Therefore, the rejection of claim 23 as allegedly being unpatentable over Lloyd in view of Watanabe is improper.

Applicants respectfully contend that claim 21 is not unpatentable over Lloyd in view of Watanabe, because Lloyd in view of Watanabe does not teach or suggest each and every feature of claim 21. For example, Lloyd in view of Watanabe does not teach or suggest the feature: "a portion of at least one end of the conductive element extends beyond a surface of the laminate" and "applying a compressive pressure to the portion of the at least one end of the conductive element, wherein the compressive pressure applied to the portion of the at least one end of the conductive element forms a contact pad extending beyond the surface of the laminate".

The Examiner argues that "Lloyd discloses ... applying a compressive pressure to the at least one end of the conductive element (column 3, lines 20-24) whereby the compressive pressure applied to the portion of the at least one end of the conductive element (15) forms a contact pad (35, 37, column 3, lines 37-38) extending beyond a surface of the laminate (10)".

In response, Applicants contend that column 3, lines 20-24 of Lloyd pertain to FIG. 2 of Lloyd in which the compressive pressure is applied by the ram 17. However, the portion of the at least one end of the conductive element 15 that extends beyond the surface of the laminate10, to which the compressive pressure is applied by the ram 17, is removed (as shown in Fig. 3 of Lloyd) before the alleged contact pad (35, 37) is formed. Therefore, the compressive pressure

produced by the ram 17 of FIG. 2 in Lloyd does not form the alleged contact pad (35, 37), as required in claim 21.

Based on the preceding arguments, Applicants respectfully maintain that claim 21 is not unpatentable Lloyd in view of Watanabe, and that claim 21 is in condition for allowance. Since claims 22-24 depend from claim 21, Applicants contend that claims 22-24 are likewise in condition for allowance.

**35 U.S.C. §103(a): Claim 29**

The Examiner rejected claim 29 under 35 U.S.C. §103(a) as allegedly being unpatentable over Reimann ('497) in view of Curcio et al. (U.S. Patent 6,504,111).

The Examiner alleges that "Reinman et al. discloses all of the limitations of the claimed invention, except for a top surface of the conductive pad coplanar with a top surface of the upper portion of the conductive element." The Examiner appears to be relying on the Examiner's arguments for rejecting claim 27 under 35 U.S.C. §102(b) over Reimann to apply to the rejection of claim 29 under 35 U.S.C. §103(a) over Reimann in view of Curcio aside from the particular feature of: "wherein a top surface of the conductive pad is coplanar with a top surface of the upper portion of the conductive element" in claim 29. Accordingly, Applicants respectfully contend that the arguments that Applicants presented *supra* for traversing the rejection of claim 27 are likewise valid arguments as to why claim 29 is not unpatentable over Reimann in view of Curcio.

As to the aforementioned particular feature in claim 29, the Examiner argues: "Curcio et al. shows in figure 3 having a top surface of the conductive pad coplanar with a top surface of the upper portion of the conductive element.... It would have been obvious to one having ordinary skill in the art at the time the invention was made to have teaching's Curcio (figure 3) in the structure of Reinman et al. for the purpose of providing directly electrical contact of a component to a laminate board."

In response to the preceding argument by the Examiner, Applicants note that the Examiner alleges that in Reimann, the metallic foil 42 represents the conductive pad of claim 29, and the conductive resist 40 represents the upper portion of the conductive element of claim 29.

Thus the Examiner is effectively arguing that it would be obvious to modify Reimann by having the top surface of the metallic foil 42 coplanar with the top surface of the conductive resist 40 for the alleged purpose of "providing directly electrical contact of a component to a laminate board". Applicants note that the only Figure in Riemann in which it is relevant to connect a component to a laminate board is FIG. 14 which shows a multilayer printed wiring board 62. In fact, there is no disclosure in Riemann of any intent to electrically connect a component to a laminate in any of FIGS. 1-12. Please note that the final product for actual use in Reimann is the multilayer printed wiring board 62 of FIG. 14. In FIG. 14, the conductive resist 40 is totally internal to the multilayer printed wiring board 62. In FIG. 14, it is physically impossible to directly connect electrically to the conductive resist 40 and all electrical connections to the conductive resist 40 are indirect electrical connections to the conductive resist 40 via the the metallic foil 42. In fact, a modification of Reimann to have the top surface of the metallic foil 42 coplanar with the top surface of the conductive resist 40 cannot have any effect on electrical contact between a component and the multilayer printed wiring board 62. Accordingly, Applicants contend that the Examiner has not established a prima *facie case* of obviousness in relation to claim 29.

Based on the preceding arguments, Applicants respectfully maintain that claim 29 is not unpatentable over Reimann in view of Curcio, and that claim 29 is in condition for allowance.

**35 U.S.C. §103(a): Claim 36**

The Examiner rejected claim 36 under 35 U.S.C. §103(a) as allegedly being anticipated by Lloyd (U.S. Patent 3,601,523) in view of Reimann (U.S. Patent 4,663,497).

As an initial point, Applicants maintain that the rejection of claim 36 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

In addition, Applicants respectfully contend that the Examiner's argument for combining Lloyd and Reimann is not persuasive. The Examiner argues without providing any supporting evidence from the prior art: "It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a laminate as taught by Reimann to modify the insulator of Lloyd in order to provide a CTE and dielectric properties for a lamination layer."

Instead of supplying a prior art reference to support the preceding argument, the Examiner alleges: "It is very well known to use laminated as an insulation to allow the insertion of internal layers such as conductive or insulating layers in order to control the coefficient of thermal expansion (CTE) and dielectric properties.

In response, Applicants respectfully challenge the Examiner's allegation that "[i]t is very well known to use laminated as an insulation to allow the insertion of internal layers such as conductive or insulating layers in order to control the coefficient of thermal expansion (CTE) and dielectric properties". Accordingly, Applicants respectfully request that the Examiner supply adequate evidentiary support as required by MPEP 2144.03C.

Furthermore, Applicants further contend that even if the Examiner should provide adequate evidentiary support for the preceding allegation of what is allegedly well known, the

Examiner's argument for applying what is allegedly well known is based on circular reasoning. The Examiner is arguing that it is obvious for Lloyd to replace the Lloyd's insulator by a laminate to control the CTE and dielectric properties of the laminate, which is circular reasoning and thus not persuasive.

Furthermore, Applicants contend that : 1) Lloyd does not teach or suggest a need to control CTE and dielectric properties; and 2) if Lloyd wanted to control the CTE and dielectric properties then one could choose the material of Lloyd's insulator to control the CTE and dielectric properties of Lloyd's insulator, which is simpler and less expensive than replacing Lloyd's insulator by a laminate.

Based on the preceding arguments, Applicants respectfully maintain that claim 36 is not unpatentable over Lloyd in view of Reimann, and that claim 36 is in condition for allowance.

**35 U.S.C. §103(a): Claim 37**

The Examiner rejected claim 37 under 35 U.S.C. §103(a) as allegedly being anticipated by Curcio et al. (U.S. Patent 6,504,111) in view of Condensed Chemical Dictionary of Hawley's (hereafter CCD).

As an initial point, Applicants maintain that the rejection of claim 36 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

In addition, Applicants respectfully contend that claim 37 is not unpatentable over Curcio in view of CCD, because Curcio in view of CCD does not teach or suggest each and every feature of claim 37. For example, Curcio in view of CCD does not teach or suggest "a bonding layer between the first and second laminates such that the contact pads of the first and second conductive elements are electrically connected, wherein the bonding layer comprises conductive metal filled epoxy".

The Examiner admits: "Curcio discloses the claimed invention, except for specifying that the thermosetting resin/polymer is epoxy."

The Examiner argues: "Epoxy is one of the best-known thermo sets in the electronic industry used in circuit boards. CCD shows epoxy resin as adhesives for composites and for metals glass, and ceramics disclosed in page 450, column 1.... It would have been obvious to one having ordinary skill in the art at the time the invention was made to have epoxy to provide the thermosetting resin/polymer of Curcio, as taught by CCD, because the epoxy is well known thermosetting material for use in the circuit boards for the purpose of providing a high coefficient of thermal expansion, since it has been held to be within the general skill of a worker in the art to

select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416."

In response, Applicants contend that the preceding argument by the Examiner is not persuasive for at least the following reasons. A first reason that the preceding argument by the Examiner is not persuasive is that the Examiner has made an unsupported allegation of what is "best-known" which Applicants hereby dispute and respectfully request that the Examiner provide adequate evidentiary support as required by MPEP 2144.03C.

A second reason that the preceding argument by the Examiner is not persuasive is that the Examiner has not alleged or supported the use of an conductive metal filled epoxy for use as a bonding layer for electrically connecting contact pads as is required in claim 37.

A third reason that the preceding argument by the Examiner is not persuasive is that the Examiner has not provided any evidence from the prior art to support the alleged motivation to have an conductive metal filled epoxy for use as a bonding layer for electrically connecting contact pads for the reason of having a high coefficient of thermal expansion. First, the phrase "high coefficient of thermal expansion" is ambiguous since the Examiner has not specified the scope of "high". Second, the Examiner has not shown motivation found in the prior art for having a high coefficient of thermal expansion in a bonding layer for electrically connecting contact pads. Third, the Examiner argues the use of epoxy as an obvious design choice for the purpose of providing a high coefficient of thermal expansion, whereas there is no teaching or suggestion in Curcio that having a high coefficient of thermal expansion is a purpose of having a conductive adhesive between contact pads.

Based on the preceding arguments, Applicants respectfully maintain that claim 37 is not

unpatentable over Curcio in view of CCD, and that claim 37 is in condition for allowance.

35 U.S.C. §103(a): Claims 38-39

The Examiner rejected claims 38-39 under 35 U.S.C. §103(a) as allegedly being anticipated by Rosenthal et al. (US Patent 3,105,729) in view of Reimann ('497).

As an initial point, Applicants maintain that the rejection of claim 36 is improper because a claim cannot be anticipated under 35 U.S.C. §103(a) and also because a claim cannot be anticipated by a combination of references.

In addition, Applicants respectfully contend that claim 38 is not unpatentable over Rosenthal in view of Reimann, because Rosenthal in view of Reimann does not teach or suggest each and every feature of claim 38. For example, Rosenthal in view of Reimann does not teach or suggest "impacting the surface of the laminate by the conductive element, wherein said impacting forms a hole in the laminate ".

The Examiner argues that in Rosenberg, the panel 20 is the laminate of claim 38, the sphere 22 is the conductive element of claim 38, and the hole 30 in FIG. 6 is the hole of claim 38 allegedly formed by the sphere 22 upon impacting the surface of the panel 20.

In response, Applicants respectfully contend that the hole 30 is preformed prior to insertion of the sphere 22 therein and is not formed by the sphere 22 upon impacting the surface of the panel 20. The hole 30 is just an embodiment of the of the hole 21 of FIG. 1 and the hole 21 of FIG. 1 is clearly a preformed hole. See Rosenthal, col, 2, lines 34-36 ("Referring to FIGURES 1, 2, and 5, a deformable panel 20 is formed with an aperture 21 for receiving a conductive sphere 22"). The remaining Figures, including FIG. 6, are variants of FIG. 1 in which conductors are disposed in the hole in different geometrical configurations. For FIG. 4, Rosenthal recites in col. 2, line 53: "When the sphere 22 is pushed into the aperture ...". For FIG.

6, Rosenthal recites in col. 2, lines: "The wires are first placed in the hole, then the sphere is pressed into the hole in the position shown". Applicants contend that it is clear from the language in Rosenthal that the hole is preformed in the panel 20 and is not formed by the sphere 22 upon impacting the surface of the panel 20 as alleged by the Examiner.

Based on the preceding arguments, Applicants respectfully maintain that claim 38 is not unpatentable over Rosenthal in view of Reimann, and that claim 38 is in condition for allowance. Since claim 39 depends from claim 38, Applicants contend that claim 39 is likewise in condition for allowance.

## CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0547.

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